

# HOMEBREW COMPUTER CLUB

# NEWSLETTER

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Robert Reiling, editor □ Post Office Box 626 □ Mountain View, CA 94042

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March 31, 1976

THIS MONTH - Robert Reiling

HOMEBREW COMPUTER CLUB ONE YEAR OLD - The first club meeting was held March 5, 1975. Gordon French and Fred Moore put it together and are due credit for starting the first amateur computer club in the Bay Area. Thirty-two people attended that meeting and now attendance exceeds 250 people. The Newsletter is currently distributed to approximately 600 people each month, mostly in the Bay Area but many are sent throughout the United States and some are sent to Canada and Overseas.

This growth can be attributed to an unusual interest by people in hobby computing, availability of hardware that is affordable, and the need to exchange ideas and information about hardware and the ever necessary software. Currently, no single source really covers the information needed by the computer hobbyist. The HOMEBREW COMPUTER CLUB is a meeting place where every two weeks, if one desires, he can meet and talk with someone with a common interest. New things may be learned and problems can be solved.

The Club's meeting format is unique in that every meeting is conducted in a forum fashion. Lee Felsenstein moderates and conducts the "mapping period" so that during the following "random access period" one can quickly contact someone with compatible interests.

No meeting to date has been dull and no doubt this can be attributed to our unique approach. Let's keep it that way with an opportunity for everyone to be involved.

FLEA MARKET - Mark this on your schedule. Randy Wigginton has again arranged for flea market space at Bellarmine College Preparatory in San Jose. The date is April 21, 1976 and the time 7:00 P.M. This is the place to buy and sell computer goodies. Contact Randy after seven if you need directions, telephone 732-1656 in Sunnyvale.

MOS TECHNOLOGY - Peter Schnal telephoned following the last meeting to explain that MOS Technology is only dropping the MCS6501 which was pin-compatible with Motorola's MC6800. MOS Technology will continue to produce and market five microprocessors in its 6500 family, which are not pin-compatible with Motorola's MC6800. The companies have agreed to a cross license relating to patents in the microprocessor field.

SUPER SIMPLE FLOPPY DISK INTERFACE - The Computer Hobbyist has developed a simple, inexpensive controller for floppy disk drives. Issue number nine has part 1 of a two part article. It is excellent and if you are interested in a floppy disk system you should read it. The Computer Hobbyist is available by subscription at \$6.00 per year. Write TCH, Box 295, Cary, NC 27511

Sasolburg  
South Africa

Biccari  
Italy

HOME BREW COMPUTER CLUB

As normal it is again the Americans that take the lead in computer hobbyist clubs.

After a troublesome search I have found that no such club in any form exists in South Africa.

In my area there are quite a few people interested in forming a club. Unfortunately it is quite discouraging that no circuits are available on 8008 or 8080 microprocessors.

At a beginning stage our finances are limited so we decided to try and find means of building the system ourselves. In this circumstance we decided to contact your club to try and acquire the following:

1. Circuit for complete 8008 or 8080 system (For us P.C. board layout diagrams are almost a must.)
2. Circuit for T.V. input/output system.

We would gladly pay an amount for your service. As we are eager to start, we would appreciate an answer soon.

Correspondence with your club members would mean a lot to us.

I hope we are not asking to much.

Yours faithfully,  
F. J. Pretorius

F. J. Pretorius  
19 Adumstr  
Sasolburg  
South Africa

Dear Sir,

At the end of the article COMPUTER BITS by Jerry Ogdin in the January issue of Popular Electronics there was a list of hobbyist clubs. I chose your club, so if you will accept me I would like to join your HOME BREW COMPUTER CLUB. You could ask why I want to join and it would be a little difficult to explain it for me in English. I may try it; I am a 30 year old man, always been a DO IT YOURSELF hobbyist from mechanics to chemistry to boating to painting to sculpture and so on, I have always liked to do things with my hands, but lately I fell in love with electronics and particularly with mini-computers, but I am not ready yet to go into constructing one from kits. I know my present limits, even if I did a COBOL programming course and so I know something about the computer.

Before I start to construct something I want to know everything possible about the matter, and since in Italy there are no magazines, no books, no data where I could get the information and the knowhow I need, that is the main reason for joining your club. I want to exchange or better learn your experiences, to know your advices, to have your help, to know where to get some books, data sheets, electronic components, and the like.

Hoping you would accept me as a member in your club and eagerly expecting your reply, I am yours.

Salvatore DI FRANCO  
VIA ANNUNZIATA No. 6  
71032 BICCARI (FOGGIA)  
ITALY

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HOME BREW COMPUTER CLUB members if you can assist in any way take the time to write these people. Better yet send them some technical material. You can be sure it will be appreciated.

Dear Mr. Gates,

I was gratified to see your letter published in the HOMEBREW COMPUTER CLUB NEWSLETTER. I am one of the 10% minority who paid for Altair 8K BASIC. One of the reasons I invested a substantial amount of money in an Altair with 8K of dynamic RAM memory and I/O board, was so I could get 8K BASIC, which I plan to use for accounting and other applications.

As a professional programmer/analyst with almost 10 year's background in accounting, manufacturing and research applications using COBOL, PL/1 and assembler language, I deplore the flagrant abuse of copyrighted software apparently practiced by many hobbyists, and some professionals too. What is the difference between stealing software and someone's stereo outfit? In either case the guilty party is a common thief.

There appears to be a doubt in some people's minds that charges for infringement of software copyrights would stand up in court. Unfortunately, computer programs are very easy to copy and steal. I'm not a lawyer, but I read in Computerworld and other industry publications about cases which have stood up.

I have no objection to legitimately paying \$75 for 8K BASIC, or to being required to purchase suitable hardware in order to qualify for that price. However, I resent the fact that people are getting free bootlegged copies.

I would like to develop some good software for business and accounting applications using microprocessors. If I were to spend hundreds of hours of my time - not to mention some money too - on a general ledger package, why should I give it away for someone else to sell services on? We programmers have to eat, too! So why should BASIC or APL be given away?

Charles L. Pack

INTERMETRICS PL/M6800 COMPILER - Walton Ferris, Jr.

The principle developer of this compiler is Glen Bingham. The name of the compiler is PL/M6800. It compiles for the 6800 microprocessor, in a Motorola Loader format, and is as compatible with PL/M (for the 8080) as possible. The I/O has to be different. It was developed by Intermetrics, 701 Concord Ave., Cambridge, Mass. 02138, (617) 661-1840, and is available now through GE timesharing or may be purchased (\$1000). It is about 200K bytes long and runs on 360 or 370 under OS. The object code is put onto disc and one may print only the error list file, or the source with error list, or the assembly code, etc. A 160 page Specification Manual is available from Intermetrics for \$10 which is sufficient for those that know how to use a procedure oriented language like PL/1 or ALG01. At the Palo Alto GE timesharing office, 969-3772, the person to talk to is Bob Goldstein, who also knows about the programs for Intel, Motorola, TI, NEC, etc. I wonder if someone local could arrange for this little 200K program to be put on some company's 360 for our use, or if some company who buys it for their own use could allow us off-shift access to it? Alternatively the 6800 users could perhaps make arrangements with GE to share one account; Bob is willing to set up an ID check system but there are also some economic hurdles.



## OCTAL LOADER PROGRAM - Charles L. Pack

Are you tired of loading your Altair or Imsai through the switch panel? You say it took you 2½ hours to enter 698 bytes and then the power failed? Well, here is an octal loader program which allows you to type in your program, three digits per binary byte, on just about any keyboard. The octal loader itself occupies only 86 bytes; after it has been entered for the first time you can punch it out on paper tape.

This loader also checks your data for errors. Each program byte consists of a three-digit octal number whose value is between 000 and 377, inclusive. Only the digits 0 through 7 are allowed, and the first octal digit within each byte must not be greater than 3. Incorrect digits, alphabetic characters and special characters are ignored. Valid digits are "echoed" to your output device (normally a Teletype printer or a video display).

In addition, you may format your printout by using the carriage return and line feed keys and the space bar. This is desirable because a Teletype machine does not automatically start over at the beginning of a new line when the carriage reaches the end of the current line. So, instead of your output looking like 161061124000333000346201 it can look like this: 161 061 124 000 333 000 346 201 . Furthermore, you can segregate parts of your program on different lines, to facilitate proof reading. The carriage return, line feed and space characters are not stored in the computer; all program bytes are stored consecutively.

The hardware requirements for this program are an 8080-based microprocessor with at least 256 bytes of memory; a suitable I/O interface, an ASCII-encoded keyboard and some type of display. The latter two items can be a Teletype machine or a "TV Typewriter". I have implemented the octal loader on an Altair 8800 equipped with 4K bytes of memory, a Processor Technology 3P+S I/O board and an ASR-33 Teletype machine.

In the listing, all numbers are in octal except STMT which is the statement number in decimal. PG is the memory page and ADDR is the memory address within the page. The octal loader begins at location zero and occupies 86 bytes. The second and third bytes of the loader (in stmt. no. 1) are the memory address and page number, respectively, where it will start loading your binary data. You can use any address you wish here, as long as it is above the loader.

The address jumpers on your I/O interface board must be set for 000 and 001. 000 is for the status byte and 001 is for the data byte. The contents of the bytes at locations 000,015 and 000,017 (in statements numbered 6 and 7) will depend on the type of I/O interface you are using; more specifically, which status bits you are using for "receiver data ready" and "transmit buffer empty". On my 3P+S I/O board I used the rightmost bit (bit 0) for "data ready" and the leftmost bit (bit 7) for "transmit buffer empty". I intended this to be compatible with the Altair 88-SIO board revision 1, or revision 0 with the status bit

modification. If you have an SIO board revision 0, you will need to change the contents of bytes 000,015 and 000,017 to octal 240 instead of octal 201. If you have a 3P+S I/O board, you can use any status bit configuration you want, by changing the jumpers in area "G". On the Altair SIO board, the choice of status bit is fixed by the hardware; there is no jumper.

STMT	PG	ADDR	OBJECT	CODE	S O U R C E	S T A T E M E N T
1	000	000	041	000 001	LXI	H ;Load memory address
2	000	003	001	000 002	NXBYTE: LXI	B ;B is byte counter; C is ;temporary work register.
3	000	006	161		MOV	M,C ;Zero out the memory byte.
4	000	007	061	124 000	NXDIGT: LXI	SP,STKADD ;Load stack pointer
5	000	012	333	000	IN	0 ;input status channel
6	000	014	346	201	ANI	201 ;zero out unwanted bits
7	000	016	376	201	CPI	201 ;is data available?
8	000	020	300		RNZ	; back to NXDIGT if not
9	000	021	333	001	IN	1 ;input data channel
10	000	023	346	177	ANI	177 ;zero out parity bit
11	000	025	376	060	CPI	060 ;is character less than 0?
12	000	027	332	051 000	JC	TESTCR ;jump if true
13	000	032	376	070	CPI	070 ;is character > 7?
14	000	034	320		RNC	; back to NXDIGT if true, ; character is invalid.
15	000	035	110		MOV	C,B ;
16	000	036	015		DCR	C
17	000	037	015		DCR	C ;is this the first digit?
18	000	040	302	066 000	JNZ	ECHO ;jump if not
19	000	043	376	064	CPI	064 ;is character > 3?
20	000	045	320		RNC	;back to NXDIGT if true, ;character is invalid because ;first octal digit must be <= 3.
21	000	046	303	066 000	JMP	ECHO ;we have a valid character.
22	000	051	376	015	TESTCR: CPI	015 ;carriage return?
23	000	053	312	066 000	JZ	ECHO ;jump if true
24	000	056	376	012	CPI	012 ;line feed?
25	000	060	312	066 000	JZ	ECHO ;jump if true
26	000	063	376	040	CPI	040 ;space?
27	000	065	300		RNZ	;back to NXDIGT if not, ;character is invalid.
28	000	066	323	001	ECHO: OUT	1 ;output data channel to ;"echo" a valid character.
29	000	070	376	060	CPI	060 ;is character a digit?
30	000	072	330		RC	; back to NXDIGT if true.
31	000	073	346	007	ANI	007 ;zero out all but the three ;rightmost bits.
32	000	075	110		MOV	C,B
33	000	076	015		DCR	C ;is this the third digit?
34	000	077	372	114 000	JM	ORMEM ;jump if true
35	000	102	015		DCR	C ;is this the second digit?
36	000	103	372	111 000	JM	SECND ;jump if true
37	000	106	007		RLC	;shift
38	000	107	007		RLC	; left
39	000	110	007		RLC	; three bits
40	000	111	007		SECND: RLC	;shift
41	000	112	007		RLC	; left
42	000	113	007		RLC	; three bits
43	000	114	266		ORMEM: ORA	M ;OR A-register
44	000	115	167		MOV	M,A ; with memory
45	000	116	005		DCR	B ;decrement digit counter
46	000	117	360		RP	;back to NXDIGT if we haven't ;yet processed three digits.
47	000	120	043		INX	H ;increment memory address
48	000	121	303	003 000	JMP	NXBYTE ;back to enter another ;byte.
49	000	124	007	000	STKADD: DW	NXDIGT

## T I N Y B A S I C 6 8 0 0

Tiny BASIC is a proper subset of Dartmouth BASIC, consisting of the following statement types only:

LET	IF	RETURN	LIST
PRINT	GOTO	END	RUN
INPUT	GOSUB	CLEAR	

Arithmetic is in 16-bit integers only with the operators + - \* / and nested parentheses. There are only the 26 single letter variable names A,B,...Z, and no functions. There are no strings or arrays. This language has been defined and discussed extensively in recent issues of PCC and the offshoot newsletter.

For the 6800, this language has been augmented to include the functions, RND, USR, and PEEK and POKE, giving the user access to all his system components in the 6800 from the BASIC program. While Tiny BASIC specifies line numbers less than 256, this version allows numbers to 32767.

The interpreter fits in 2K of memory and uses another 200 bytes for temporaries (in page 0). This leaves all the rest of memory for user programs. It is available in two versions, one for RAM-based systems (0-08FF) and one for the AMI single board computer "PROTO" (program resides in pROM E000-E7FF).

For a copy of the object tape and user manual send \$5.00 to:

Tom Pittman, P.O. Box 23189, San Jose, CA 95153

Please specify whether it is for PROTO or RAM-based system.

This is intended as a low-margin enterprise. If the response is good there will be more software available on the same basis. If there is little interest, or if there is heavy pirating, this will be considered an expensive experiment.

### LO\*OP CENTER REPORT

LO\*OP Center is alive and well in Cotati! We have just finished giving a 40 hour course in Computer Literacy to 4th, 5th, and 6th graders from our local public school. Anyone with ideas to add to our course or interest in giving such a course please contact us. Our staff is now engaged in consolidating our material for publication. The book should be useful to teachers and self-directed students as well as hobbyists who would like to get involved with teaching. Yours from clickity-clickity land, Liza

LO\*OP Center, Inc., 8099 La Plaza, Cotati, CA 94928  
Telephone number (707) 795-0405

### CLUB MEETING SCHEDULE

HOME BREW COMPUTER CLUB meetings are held every two weeks; April 14th, April 28th, May 12th, etc. Location is Stanford Linear Accelerator Center, Menlo Park, California. Meetings begin at 7:00 P.M. Ask the guard at the gate for directions to the meeting room.



### Status Report: Dr. Dobb's Journal of Computer Calisthenics and Orthontia

*Dr. Dobb's Journal* started out to be a three-issue quickie for distributing information about Tiny BASIC, an interpreted subset of BASIC that is simple to implement on micros with minimal memory. The first issue was 19 pages, xeroxed on letter paper, mailed around the end of February. The response to it made it evident that there are some significant information gaps left by the current major computer hobbyist publications. They obviously have their hands (and pages) full, just covering hardware and relatively small bits of software.

Therefore, Peoples' Computer Company decided to convert the *Journal* into a regular and ongoing publication to fill those gaps. They hired several new staff members, including a full-time Editor for the *Journal*. After a start-up pause, the system is up and running. The second issue is 36 pages, to be mailed April 12th. The third issue is scheduled to go out by April 26th, with two more issues being produced in May. Thereafter, they will settle into a regular monthly publication schedule, excluding July and December. Incidentally, these are "all meat" pages; there are no display ads.

About those information gaps — The *Journal* will function primarily as a reference publication. Primary focus will be on:  
 — Comprehensive details for implementing specific systems software. Tiny BASIC is merely one example. They are already pursuing the development of a tiny APL, MAPLE, a CAI language, PILOT-73, a structured assembler, a floppy disc file system, and anything else they can find to place in the public domain. Their second issue carries complete implementation documentations and source code for the Texas version of Tiny BASIC (TBX), Steve Dompier's music article, notes on a high level language being developed for the 8008/8080 by Scelbi, TBX mods for the TVT-2, and more. Issue 3 will include complete documentation and source code for a Denver version of Tiny BASIC, notes on a TV Dazzler software contest and a manufacturer-independent software repository, and much more.

— Reprinting articles and schematics from many of the club newsletters, out-of-print periodicals, and publications that are not generally available to the computer hobbyist.

— Detailed "blue skying", outlining projects they feel are realizable in the immediately foreseeable future. Tiny BASIC was just the first. As these projects are implemented, they will publish the details. For example, the second issue contains the first two of a forthcoming series of articles on home computer speech synthesis. They discuss Votrax, which has been manufacturing phoneme generators for some years. Until now, these have been peddled for \$3500 and up. After two lengthy conversations with the *Journal* Editor, Votrax is proposing a phoneme generator kit for hobbyists, composed of established, debugged, in-production subsystems for \$1K. *This allows the home computer to perform unlimited English language speech synthesis!*

— Indices for *all* of the major computer hobbyist periodicals, and for selected articles from a number of other publications. This is sort of a "Reader's Guide to Periodical Home Computer Literature."

— Lists and directories of: computer stores and distributors, sources of used computer equipment, clubs and organizations, home computer users & their equipment, etc..

— They will also carry classified ads, Letters to the Editor that have technical or critical content, book reviews, news quickies, and articles best categorized as "consumer protection" notes, and "computers and society" articles.

They are totally subscription-supported, so if the above sounds interesting, you might consider a trial subscription: \$1.50 for a single issue, \$3 for the first three issues, or \$10/year (10 issues). Address: PCC, Box 310, Menlo Park 94025.

## BULLETIN BOARD

FOR SALE OR TRADE - Cartrivision CCTV-VTR. Front panel, knobs, no cabinet. Color record from TV, playback from tape cartridge. B-W camera, zoom lens, mike, with cables, RF modulator, many hours of blank tapes, one pre-recorded tape, and documentation. \$500 or trade for IC's (8080), keyboard, monitor, PCB's, I/O (typewriter/printer/cassette), etc. Have Cybercom desk with CC and P.S. Pat Rankin, 1085 Tasman Dr. #29, Sunnyvale, CA 94086, telephone 734-5985

WANTED - Paper tape listing of 4K assembler or Tiny BASIC for 8080. Or can someone copy same on 1702's for me? I have 4K bytes of 1702's. Glenn Nelson, Box 1846, Brown University, Providence, RI 02912

USED KSR TELETYPES - Also, other terminals and acoustic couplers for sale. D. R. Reichel, Anderson Jacobson, Inc., 1065 Morse Avenue, Sunnyvale, CA 94086, telephone (408) 734-4030.

POWER SUPPLY - Computer grade. 20 units available, new, each supply has three outputs: 5VDC @ 12a., 15VDC @ 2.8a., 15VDC @ 2.8a, all outputs are filtered, regulated, and variable. Price \$100 plus 10% for postage and handling. Ten day guarantee if returned in good condition, 25% off if ordered before May 1, 1976. M. D. Rivers, 28 Leyfred Terrace, Springfield, Massachusetts 01108, telephone 732-5891

SEMINAR - SCAMP technical description that defines SC/MP and its supporting compliment of software and hardware. April 21, 1976 from 8:30 - Noon, Palo Alto, CA, Rickey's Hyatt House 4219 El Camino Real. Presented by Elmar and National, Wade Miracle is speaker.

**HOME BREW  
COMPUTER  
CLUB**

NEWSLETTER

Post Office Box 626  
Mountain View, CA 94042

**FIRST CLASS MAIL**